

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 8

REMARKS

Claims 1-20, 22-31, and 35-38 are pending in this application. Claims 20, 22 and 35-36 have been amended and claim 38 added to define applicant's invention with greater particularity. The amendments are fully supported by the specification and no new matter has been added. Support includes but is not limited to the following:

Claim 1	Claim 1 as filed; paragraphs 28, 36, 38, 40;
Claim 20	Claim 20 as filed; paragraph 41;
Claim 22	Claim 22 as filed; paragraph 41, 35, 37;
Claim 35	Claim 21 as filed; paragraph 41, 35;
Claim 36	Claim 2 as filed; paragraph 32, 36, 39;
Claim 38	Claim 14 as filed; paragraph 32, 35.

In view of the amendment and following remarks, Applicants respectfully request reconsideration of the claims and submit that the application is in condition for allowance.

As a preliminary matter, Applicants' representative thanks the Examiner for courtesies extended during the telephonic interview of May 5, 2004. During the interview, each of the pending rejections were discussed, and Applicants' representative agreed to provide the amendment, declaration and arguments provided herein.

I. Objection to and Rejection of Claim 35 Under 35 U.S.C. § 112, first paragraph

The objection to and rejection of claim 35 under 35 U.S.C. § 112, second paragraph as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention is respectfully traversed. While Applicants disagree that "claim 35 fails to further limit the subject matter of claim 20 in instances where the

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 9

absorbent material selected from claim 20 is magnesium phosphate, activated charcoal or combinations of molecular sieves, magnesium phosphate and activated charcoal," the objection and rejection are rendered moot by the current amendments. Claim 20 now recites an absorbent material pattern printed as dots on the internal surface of the sealant layer and claim 35 now recites all of the moisture absorbents that were recited in claim 21 as originally filed. Claim 35 therefore clearly is differentiated from claim 20 with regard to the type of absorbent recited. Accordingly, Applicants respectfully request that the objection and rejection of claim 35 under 35 U.S.C. § 112, second paragraph be withdrawn.

II. Claim Rejections Under 35 U.S.C. § 103(a)

A. Claims 1-19

The present Office Action maintains the obviousness rejections set forth in the prior Office Actions, mailed 2/13/2003 and 7/17/2003. Claims 1-5, 7-17, and 36-37 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Chaloner-Gill (U.S. Patent No. 5,445,856) in view of Kurfman (U.S. Patent No. 4,612,216). Claim 6 was rejected under 35 U.S.C. § 103(a) over Chaloner-Gill in view of Kurfman and further in view of Sasaki (U.S. No. 6,277,516). Claims 18 and 19 were rejected as allegedly obvious over Chaloner-Gill in view of Kurfman and in view of Shores (U.S. No. 5,401,536). Applicants respectfully traverse these rejections.

Applicants' invention as defined by amended claim 1 distinguishes over the combination of Chaloner-Gill and Kurfman by reciting a laminate comprising a barrier layer that includes a first layer of metal foil and a second layer of metal foil adjacent to the first layer, the first and second layers of metal foil being separate and distinct. As will be shown below, the terms "foil"

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 10

and "layer" are not synonymous with each other and the two metal foils of the claimed laminate result in functional and nonobvious differences from the prior art foil cited in the Office Action.

A prima facie case of obviousness has not been established because the cited references do not teach or suggest each element of the claimed invention. As described in the previous response and the accompanying Declaration, the barrier layer of the claimed laminate is comprised of two separate metal foils (see, for example, Jansen Declaration, ¶¶ 5-7). The separate nature of the two foils is critical to the performance of the claimed barrier layer and is clearly defined as such in the claims. The Examiner is reminded that the claims must be construed in light of the specification. The specification clearly supports the separate and distinct nature of the metal foils: paragraph 40 of the application discloses that in when embodiment "the layers of the flexible laminate may 'float' or slide over one another in a non-adhered fashion." In another embodiment, shown as Fig. 1, "[t]he first foil layer 13 is in turn attached with adhesive 14 to a second metal foil layer 15." Application, ¶ 36. Moreover, the words of a claim must be given their plain meaning. MPEP 2111.01 entitled "Plain Meaning". As one of ordinary skill in the art will understand, a foil is a "very thin sheet metal." Merriam-Webster's Collegiate Dictionary, 10th Ed., p. 451 (previously provided). Thus, the claims clearly require two separate metal foils, i.e., two sheets of metal. Therefore, the claims do not encompass a single metal sheet having two layers.

As described in the previous response, the claimed laminates provide superior leak protection over laminates having a barrier layer comprising a single metal sheet. As disclosed in paragraph 28 of the specification, metal foils have pinholes in them that allow solvent to leak from the packaging, thus causing battery failure due to corrosion-induced rupturing at this point. While thicker foil usually reduces the quantity of pinholes, the likelihood of foil cracking increases. Thicker foils are also more difficult to heat seal due to thermal conduction of heat by the thicker metal. In contrast, because the two metal foils of the claimed barrier layer are separate sheets of metal,

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 11

they will include pinholes that do not align with each other. Thus, a molecule diffusing through a pinhole in one metal foil must travel a tortuous path before diffusing out of a pinhole in the second metal foil. This process significantly slows the diffusion of solvents out of the battery housing and air and moisture into the battery housing. Thus, two metal foils with a combined thickness less than that of a single foil will perform better than the thicker single foil as shown in Figure 6 of the application.

Jansen Declaration, paragraph 7; see also Figs 1 and 2.

Figure 2 of the Declaration Appendix graphically illustrates that the improvement in performance demonstrated in the application depends on the use of two separate and distinct foils in which pinholes do not align with one another. Figure 1 of the Declaration Appendix shows that a single metal foil can not operate in the same manner. Applicants respectfully submit that the metal foils of the laminates taught by the cited references operate like the single foil of Figure 1.

In contrast to the claimed invention, the combination of Chaloner-Gill and Kurfman fail to disclose a laminate having a barrier layer with first and second layers of metal foil that are separate and distinct. Although the Examiner asserts that Chaloner-Gill teaches a laminate for protecting components of an electrochemical cell, he admits that "Chaloner-Gill fails to teach that the laminate comprises first and second metal layers, where the metal layers are adjacent to each other." Office Action, mailed 2/13/2003, page 6 (relied upon in present Office Action, pages 3-4, items 5-7). Combining Kurfman with Chaloner-Gill cannot cure this deficiency. Kurfman, directed to a laminate designed to prevent formation of crack voids that mar the appearance of metallized plastic films, (col. 1, lines 30-53; col. 4, lines 56-59) discloses a metal/metal/polymer laminate having two metal layers intimately adhered to each other. Kurfman, col. 2, lines 25-28. The metal/metal segregated structure of the laminate is very different from the separate and distinct metal foils required by the claimed invention.

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 12

Because of the way it is constructed, the segregated alloy of Kurfman is in fact a single metal foil. As explained in the attached declaration, Kurfman discloses two methods for preparing a duplex alloy. Declaration, paragraphs 8-9. In one method, the metallized film of Kurfman is formed first by depositing a metal or metal alloy on a polymer sheet. Kurfman, col. 2, lines 15-25. A second metal or metal alloy with a melting point slightly lower than that of the first is then deposited on the first metal layer. *Id.*, lines 25-34. The deposition techniques used to form the second layer (e.g. vacuum deposition, sputter coating, and ion plating) result in a single metal sheet with two compositionally different layers. Declaration, paragraph 8.

[A]ny defect, such as a pinhole, on the surface of the first metal layer will be propagated onto the surface of the second metal layer as it is deposited. This effect is produced because the second metal can only be deposited on the surface of the first metal and generally does not bridge or cover the pinhole. In addition, the deposition processes do not provide any space between the two layers into which molecules of solvent air or moisture may diffuse. Instead, the two metal layers form an inseparable intermetallic alloy at the interface between the layers.

Id.

Therefore, the foil produced by this method will have the structure illustrated in Figure 3 of the Declaration Appendix: a single foil with two compositionally different layers that contains all the pinhole defects of the first layer.

Similarly, the alternative method of preparing the duplex alloy disclosed by Kurfman, fusion bonding of the first and second metal layers after each is deposited on a polymer surface, again results in an inseparable intermetallic alloy at the interface of the two metal layers. There is no space between the layers of the duplex alloy. Therefore, the metal layers disclosed by Kurfman simply are not and can not function as the metal foils of the claimed invention.

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 13

Moreover, at least claims 36-38 of the invention further distinguish over the cited references by reciting that the two metal foils are adhered to each other with a polymeric adhesive. The intermetallic interface of the duplex alloy taught by Kurfman is not a polymeric adhesive. It can not improve the performance of the two metal foils by creating a tortuous path for diffusing species between the foils as does the polymeric adhesive used in the claimed invention. *Id.* Nor can the intermetallic interface contain an absorbent material as recited in new claim 38. In no way can the duplex alloy of Kurfman function like the two metal foils or the polymeric adhesive of the barrier layer of the claimed invention.

Accordingly, the metallized film taught by Kurfman is a single metal sheet that cannot meet the requirement for a barrier layer comprising two separate and distinct layers of metal foil in the claimed laminates. Consequently, a *prima facie* case of obviousness has not been established for any claim wherein the rejection relies on Kurfman. Applicants respectfully request withdrawal of this ground of rejection.

B. Claims 20, 22-31, 35

The rejection of claims 20, 22-31 and 35 under 35 U.S.C. § 103(a) as allegedly obvious over Chaloner-Gill in view of Hatakeyama (U.S. Patent No. 5,889,093) is respectfully traversed. The invention as defined, for example, by amended claim 20 distinguishes over the cited references by reciting a laminate that includes an absorbent material pattern printed as dots on the internal surface of the sealant layer. As described at paragraph 41 of the specification, pattern printing of dots of absorbent material "does an excellent job of forming an uniform and thin layer of absorbent in a well defined area unlike other coating techniques, and is quite inexpensive." Neither Chaloner-Gill nor Hatakeyama teach or suggest the pattern printing of dots of absorbent material on the internal surface of a sealant layer in a laminate. Nor, has the Examiner pointed to any teaching or suggestion to modify the references to provide for absorbent material pattern printed as dots on a sealant layer. Hence, a *prima facie* case of obviousness has not been

In re application of
Khalil AMINE *et al.*
Application No. 10/084,573
Page 14

established. Accordingly, Applicants respectfully request that the ground of this rejection be withdrawn.

III. Conclusion

In view of the above remarks and amendments, reconsideration and favorable action on all claims is respectfully requested. In the event that any issues remain to be resolved in view of this communication, the Examiner is invited to contact the undersigned by telephone so that a prompt disposition of this application can be achieved.

Respectfully submitted,

Date: May 19, 2004

By Joseph P. Meara

FOLEY & LARDNER LLP
150 East Gilman Street
P.O. Box 1497
Madison, WI 53701-1497
Telephone: (608) 258-4303
Facsimile: (608) 258-4258

Joseph P. Meara
Attorney for Applicant
Registration No. 44,932